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ABSTRACT

This brochure deals with three basic types of elementary schools: K-6, K-8, and senior elementary. Floor plans and sketches illustrate specifications for the school gymnasium, dressing rooms, drying rooms, boys' and girls' shower rooms, washrooms, instructors' offices, storage areas, stage, and playing fields. (Author/MLF)

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Physical Education Facilities for Elementary Schools

Prepared by
SCHOOL PLANNING AND BUILDING RESEARCH SECTION
of the School Business Administration Branch

in conjunction with
The Department of Education's
Physical Education Committee

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PREFACE

This brochure deals with three basic types of elementary schools: K-6, K-8 and senior elementary. All the facilities described will not likely be necessary in planning either the K-6 or the K-8 school. If it is envisaged that the gymnasium will be used for activities involving the use of stage facilities, it is recommended that reference be made to stage design in the Senior Elementary School Brochure.

FUNCTION

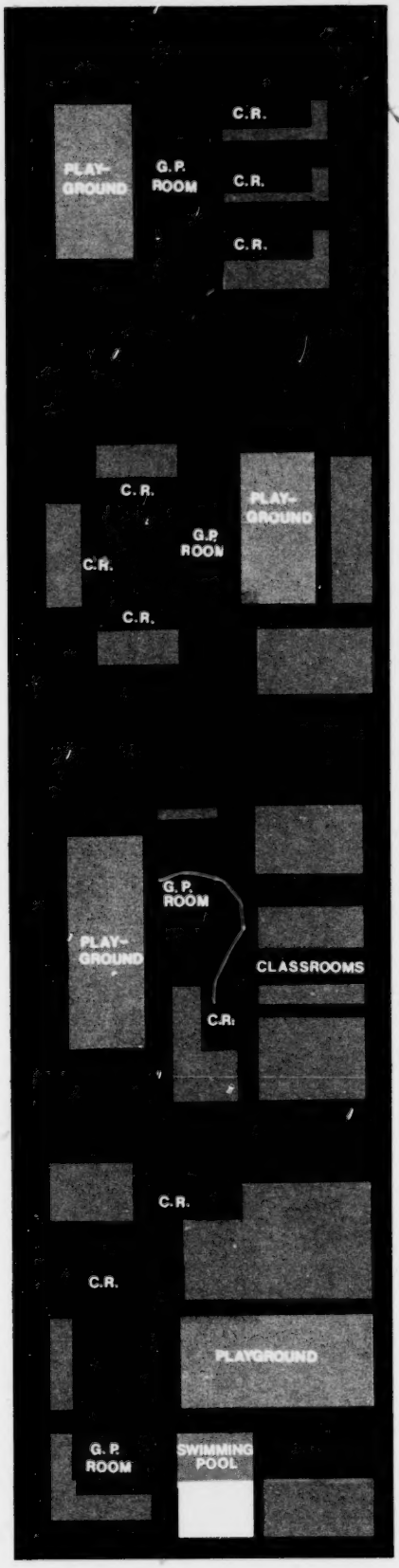
The elementary school gymnasium is the main instructional area for physical education. Other departments, and the general public should be encouraged to make use of its facilities, but its main purpose is always the implementation of the school's physical education program.

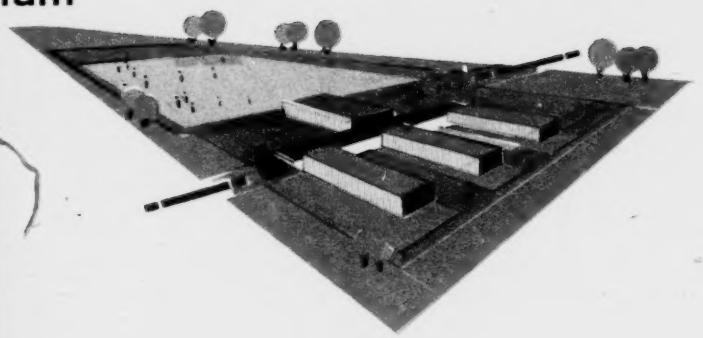
Planners of gymnasiums should be familiar, therefore, with these programs, both curricular and extra-curricular. If there is no physical education consultant with the board, the nearest regional office of the Department of Education should be contacted.

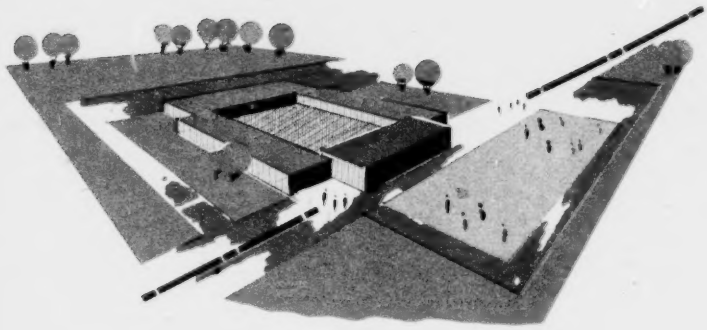
The major aims of physical education are to promote the physical health of pupils, and to develop skills through vigorous and continuing activity by all members of a group. A well-balanced program in physical education for elementary schools includes:

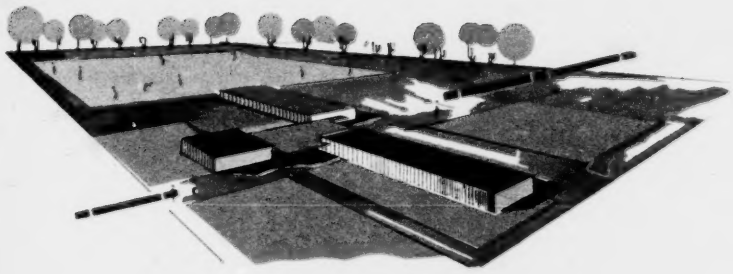
—skill instruction such as serving a volleyball, passing a basketball, performing cartwheels, etc;
—intramural sports such as mass participation in selected activities; and
—extra-curricular activities such as gymnastic clubs, demonstrations, etc.

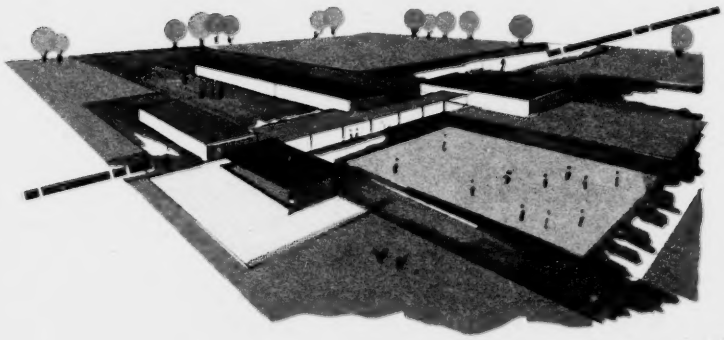
Location of Gymnasium



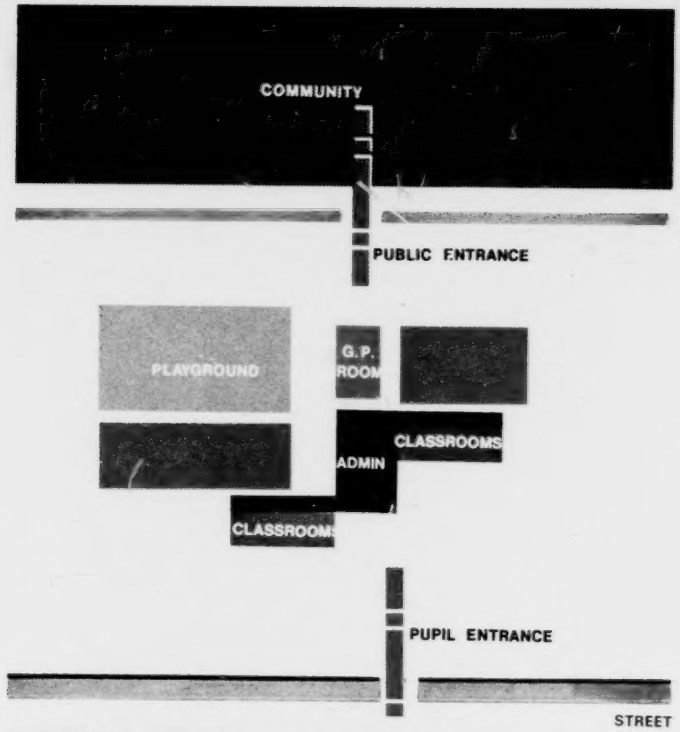








Site Accessibility

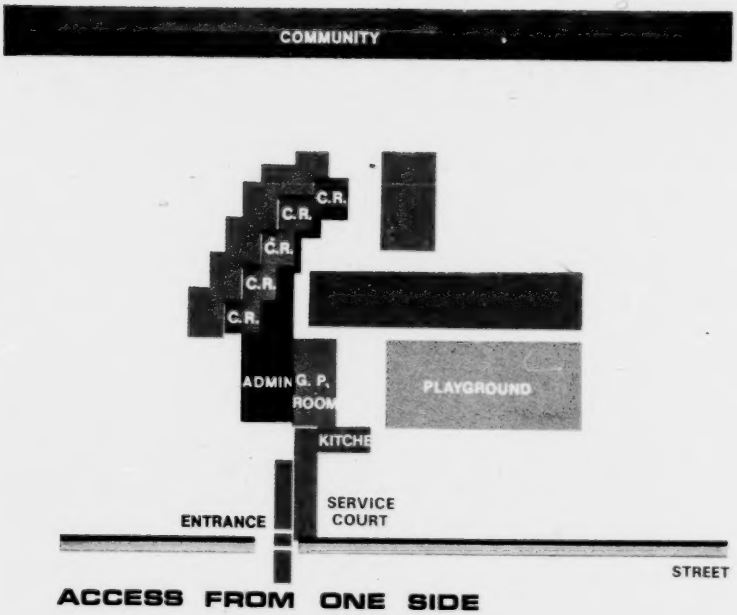


ACCESS FROM TWO SIDES

case 1

where the school is accessible from two sides, location of the general purpose room can be adjacent to the public entrance.

site accessibility affects the location of the general purpose room



ACCESS FROM ONE SIDE

case 2

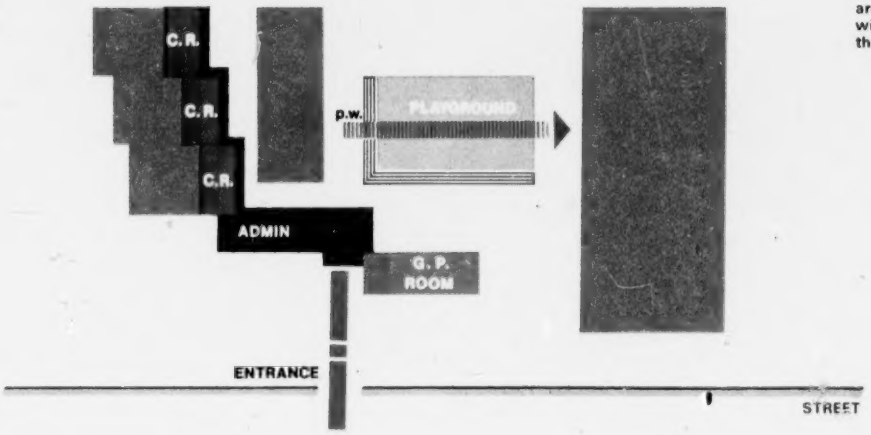
where the school is accessible from one side only, (e.g. high density zone) the general purpose room should be located near the school entrance. the community can then have access to it without entering the school building.

the general purpose room can be used for many different activities (e.g. gymnasium or dining room.)

Gymnasium & Playground - Noise Reduction

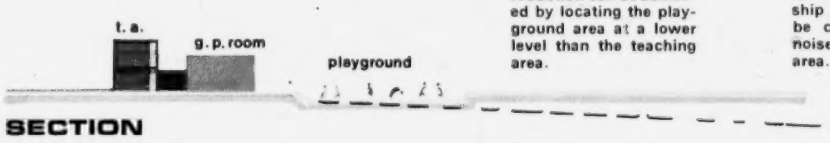
case 1

the general purpose room and playground area has been located so that prevailing winds (p.w.) will carry away noise from the teaching area.



on a sloping site, noise reduction can be achieved by locating the playground area at a lower level than the teaching area.

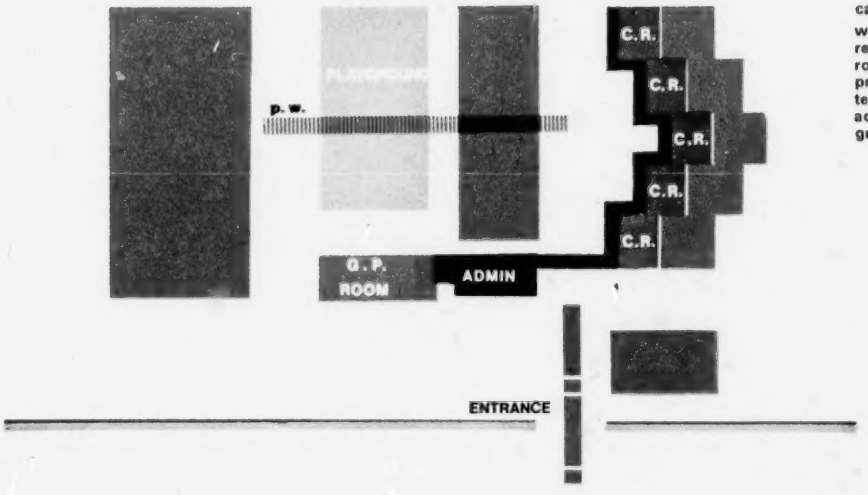
location of the playground and its relationship to the gymnasium (g.p. room) must be considered with a view to reducing noise between this area and the teaching area.

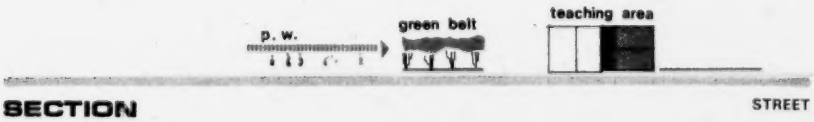


SECTION

case 2

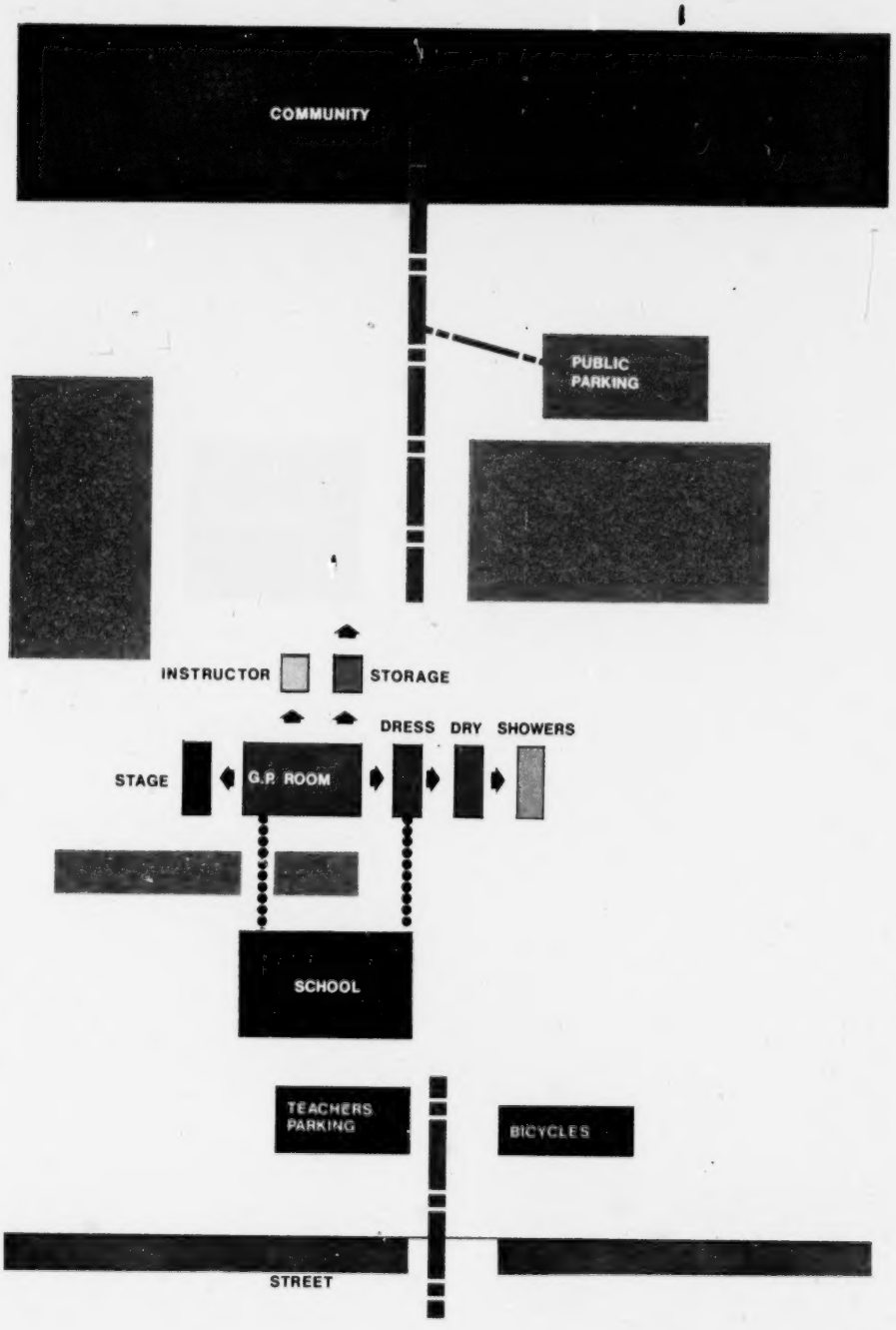
where the architect is obliged, for different reasons, to locate the gymnasium (g.p. room) and playground area in the path of prevailing winds blowing towards the teaching area, noise reduction can be achieved by means of separation with a green belt.



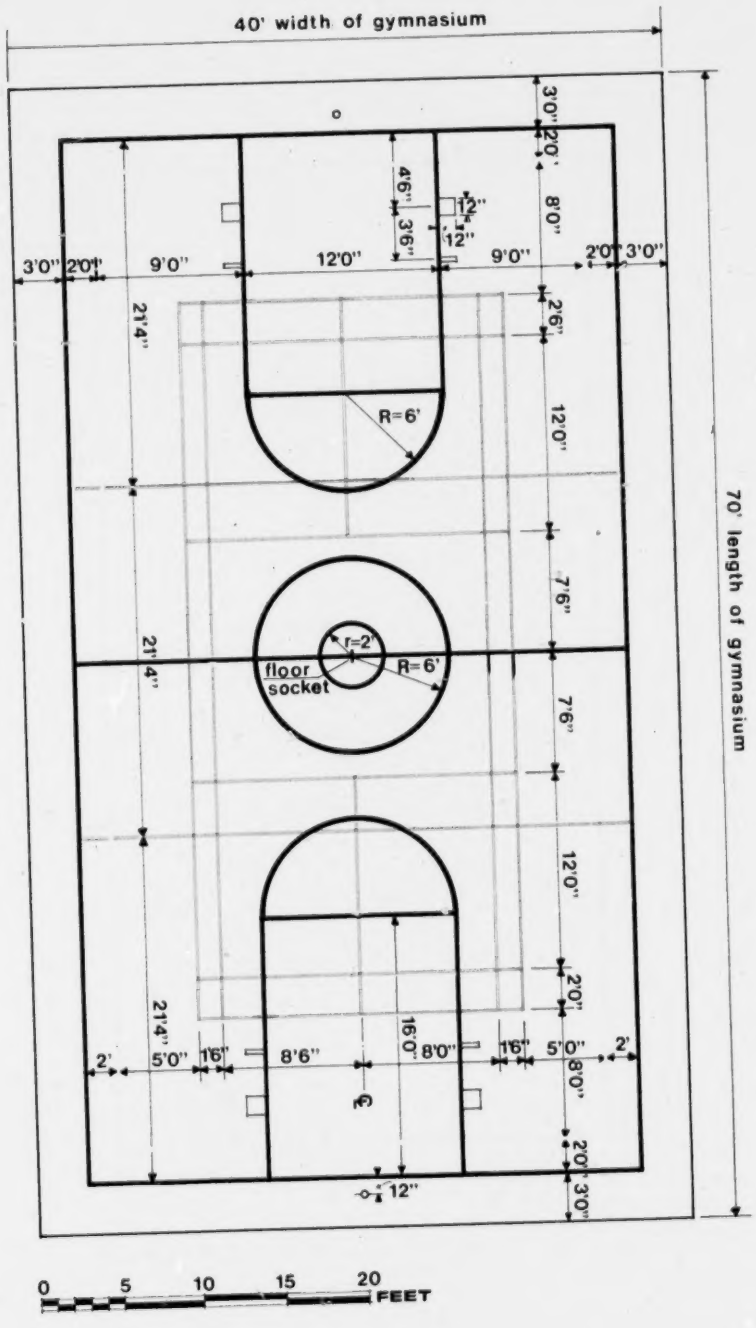


SECTION

Relationship of Gymnasium



Typical Single Gymnasium Layout



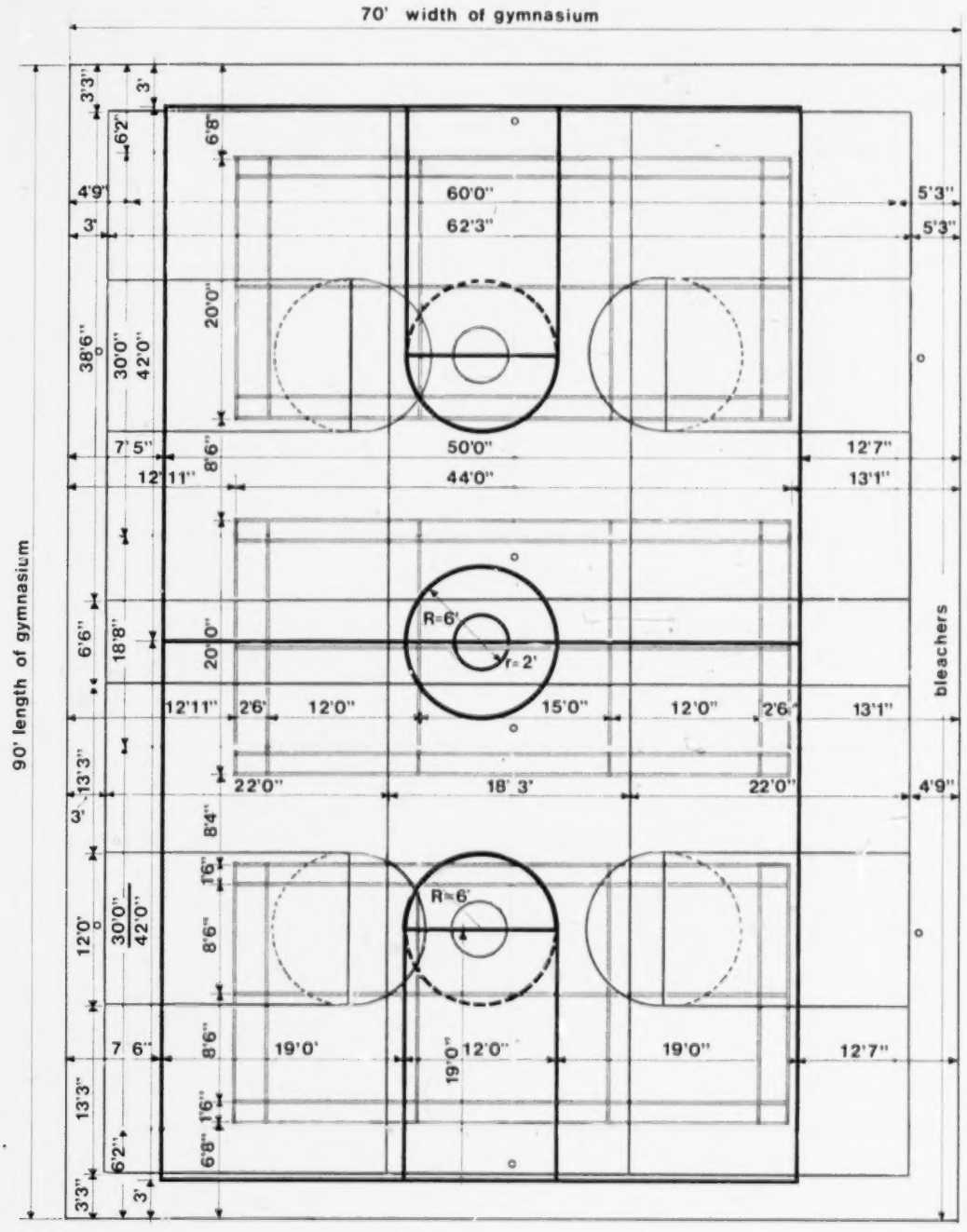
MAIN BASKETBALL COURT Black lines ——

VOLLEYBALL COURTS Yellow lines

BADMINTON COURTS White lines ——

FLOOR SOCKET °

Typical Double Gymnasium Layout



MAIN BASKETBALL COURT — Black Lines ———

SMALL BASKETBALL COURTS — Red Lines - - - - - -

VOLLEYBALL COURTS — Yellow Lines

BADMINTON COURTS — White Lines ———

FLOOR SOCKET ○

FACILITIES

Rated Capacity

In order to provide the full, required activity program, a single gymnasium is needed for all schools up to twenty classrooms in size. Further space is necessary for schools with twenty or more classrooms and the construction of a double gymnasium is advisable. Make allowances for future expansion.

Location

The gymnasium should be planned so that noise will not interfere with other classrooms, and so that it can be used after school hours independently of, and closed off from, the rest of the school building. It should be convenient to the outdoor activity area.

Dimensions

The dimensions of both the double and single gymnasium are determined by the various activities which form part of the required program; and the number of students who make use of them at any given time. Classes average 35 to 40 pupils.

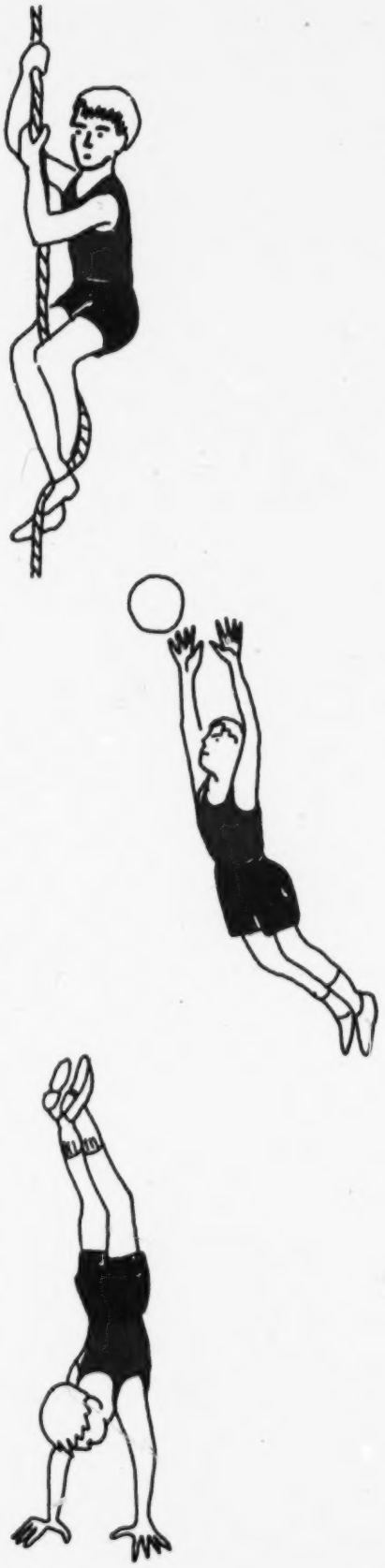
Since there is a trend toward the increased use of these facilities by adult organizations and other recreational groups, consideration should be given to these more extensive requirements.

Single gymnasium: 70 x 40 ft.
Double gymnasium: 90 x 70 ft.
Suitable ceiling height clear of obstruction: 18 ft.

Floors

A finished maple floor is recommended. The boards should not be more than 2 in. wide and should run parallel to the main court. The floor should be of built-up, well-ventilated and resilient construction.

All apparatus plates and sockets for standards should be countersunk flush with the surface of the completed floor. Use a sleeve-type socket, set in place before the concrete is poured. Take care to ensure that all court and floor markings conform to the recommendations in the latest official handbook for the sport concerned. Prior to completion of the final drawings, check socket locations and lines carefully with the individual responsible for physical education for the school board.



Walls

Walls should be of smooth, flush masonry construction. From the floor to a height of 9 ft, a washable, protective coating should be applied. It is essential that walls are flush and free of projections because they are used in various ways for equipment for class instruction and practice. There should be no heating apparatus, windows, acoustic treatment, etc., lower than 12 ft above floor level. All external corners should be rounded. All fixed equipment such as basketball backstop supports should be installed during construction. Drinking fountains should NOT be installed in the gymnasium room.

Roof Structure

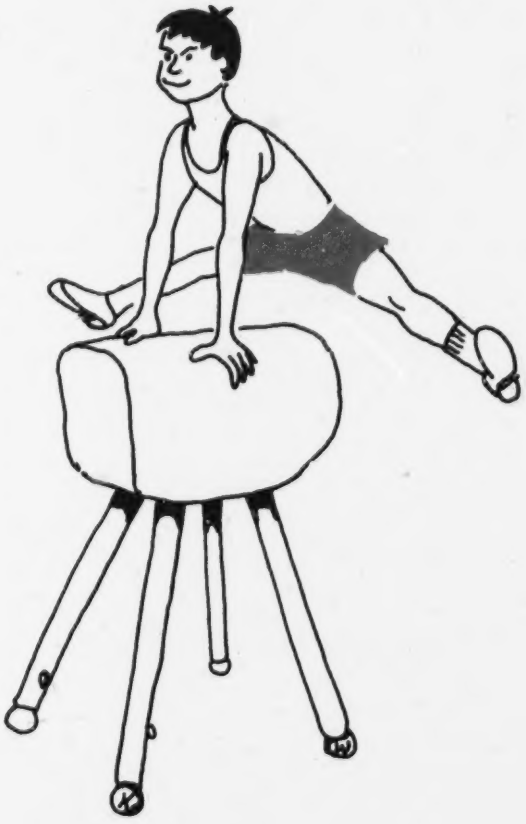
The roof structure should be designed so that it will support loads created by the use of athletic apparatus. Cross beams can be used if the roof is of steel construction. In precast concrete structural units, all bolts should be cast-in during manufacture. Suspended flush ceilings are susceptible to damage and should never be used.

Exits and Entrances

These should be located with due regard for traffic flow. Movement of pupils across the gymnasium floor in street shoes must be avoided. All doors must swing outwards. They should be flush with the inside walls and have a minimum number of projections. (Door handles, for example, should be inset). Glazed doors or panels should be amply protected. All door saddles should be flush with the floor.

Acoustics

Sound, reverberations and echo are often so great that they can constitute a major instructional problem. The provision of economical acoustical treatment is therefore recommended.



Lighting

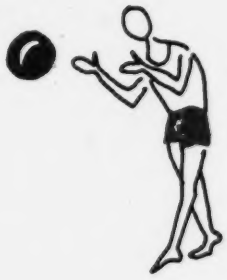
Modern design practice leans towards a reduction in window areas in gymnasiums. The following are some of the disadvantages arising from the use of a large glazed area:

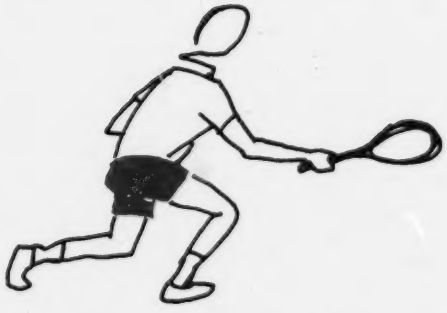
—In actual practice, windows are no longer the primary source of fresh air;
—They are usually covered with rarely-opened drapes;
—There is danger of breakage;
—There will be heat loss, heat gain, and condensation;
—The wall area will be limited as an instructional aid;
—Natural lighting is never adequate.

The quality and intensity of artificial lighting is most important.

The color scheme of the gymnasium has a direct bearing on the quality of light achieved. Generally speaking, bright colors are desirable. The ceiling should have an 85 per cent reflection factor; upper walls 65 per cent; lower wall 40-60 per cent; and floor 30-40 per cent.

An absolute minimum of 30 foot-candles, recorded 4 ft above the floor, should be maintained. Light fixtures should be arranged so that they provide uniform illumination of the required standard throughout the gymnasium and eliminate loss of light in the roof space. Light fixtures should not be installed above the lowest point of the roof structure. Select fixtures for ease of maintenance. A light-dimmer is unnecessary for physical education activity.





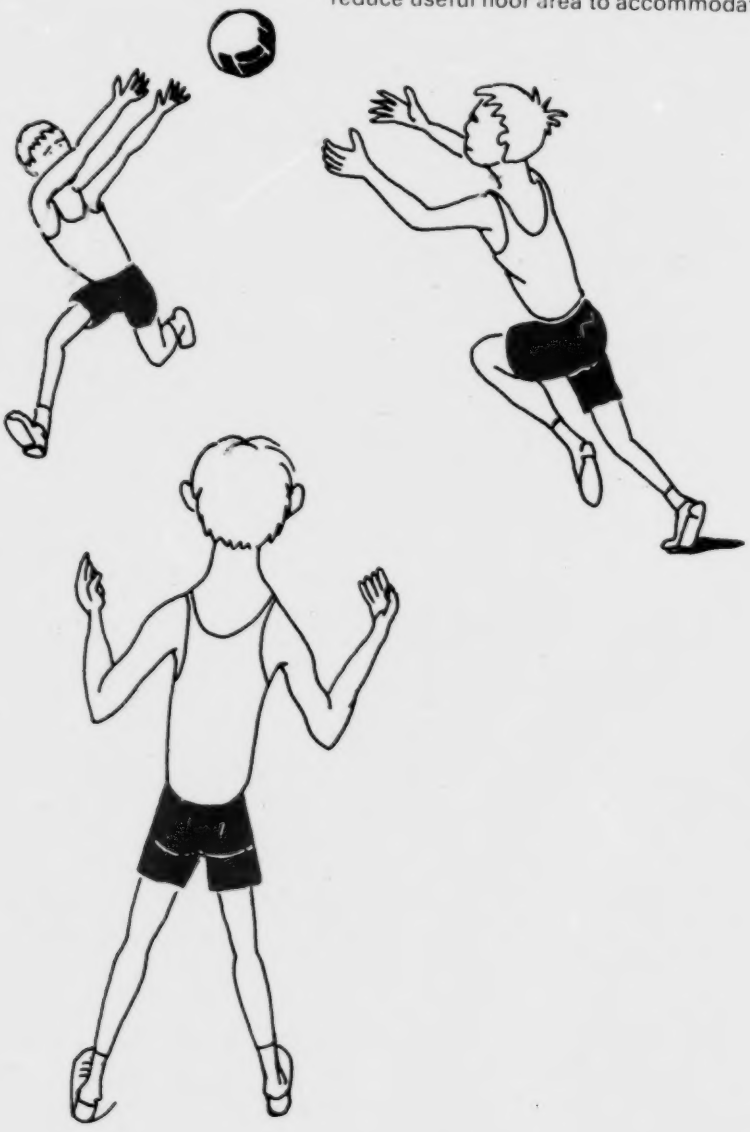
Ventilation and Heating

Make the selection of the type of heating and ventilation with special consideration for economy of operation and for capacity to provide desirable thermal and atmospheric conditions. Controls should regulate the temperature in the gymnasium independently of the rest of the school. Since physical education facilities are now used the year round, ventilation standards should be on that basis. Use special acoustic lining where noise might be transmitted through ducts. There should be more than one thermostat each individually controlled, screened against damage, and recessed. The relative humidity should be maintained at the appropriate comfort index. There should be no noticeable noise from air movement or ventilating equipment. The system should provide a minimum of six air changes per hour, of which at least three should be fresh outside air, with the remainder being re-circulated air. The temperature for gymnasium use should be 60-65F measured 4 ft above the floor. The system should respond quickly. Forced air circulation should be buffered, if outlets are not located in the ceiling. The ventilating system should contain both de-humidifiers and dust filters.

Hot water heating is not a successful method of heating gymnasiums.

Folding Partitions for Double Gymnasiums

Folding partitions operate electrically and, in case of power failure, manually. They should be sturdy and solid, and well insulated with no open spaces above below or around them. Complete division between the two gymnasiums is essential. Suspension is recommended rather than a floor track system. A small connecting door in the folding unit is desirable. When open, it should be completely recessed. The installation should make allowance for possible settling of the building. It should not be necessary to reduce useful floor area to accommodate folding door.



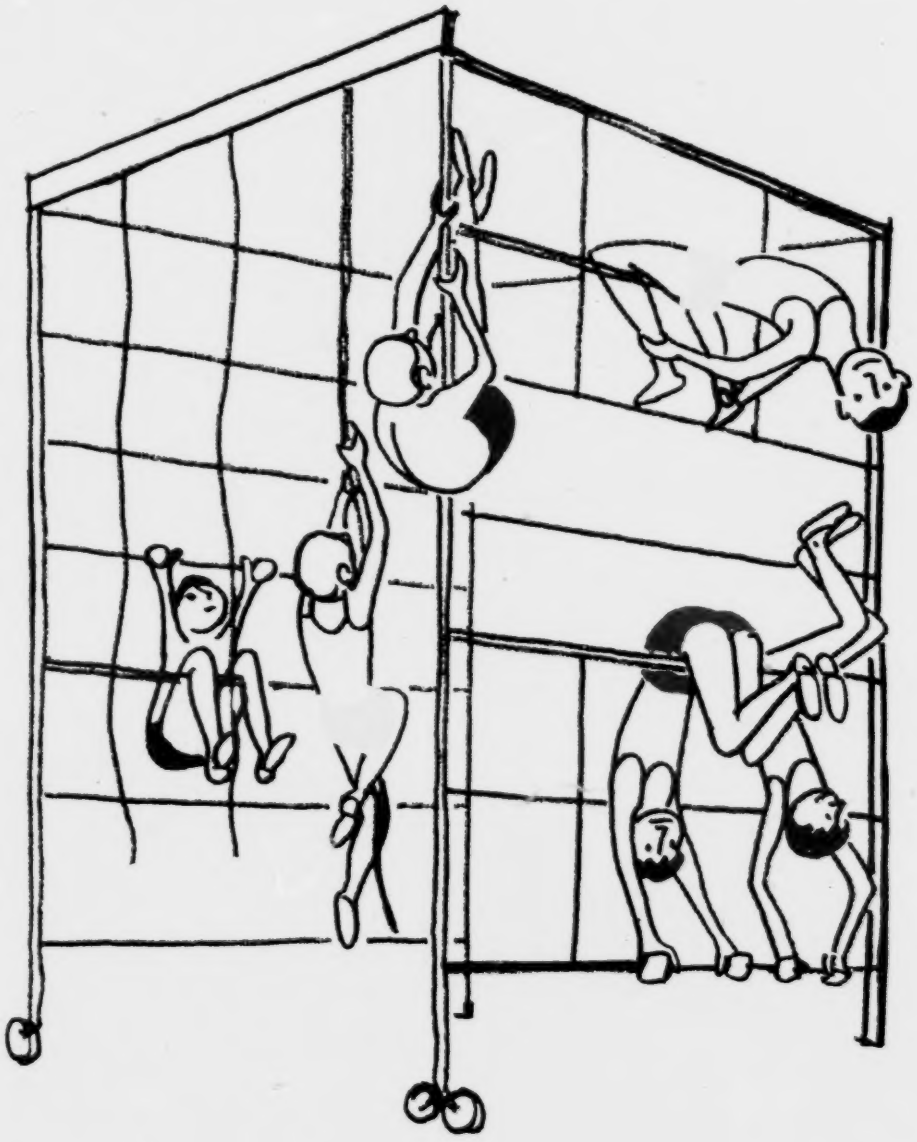
Electrical

Lighting fixtures should be protected against damage. Switch box and duplex outlet cover plates should be metal. Outlets for the following are essential: a clock out of the way of future basketball backstops; two PA speaker boxes and switch; flush exit lights with wire guards; one outlet on window wall; a microphone outlet on each side of the stage.

It is recommended that electrical features such as horns, bells, fire alarm units, switches and outlets be grouped to avoid complicated runs of conduit. Avoid placing these near backboards. One house light switch should be near the main door. Where a switch box is provided, all switches should be labelled. Sufficient circuits should be provided to accommodate all uses of the gymnasium.

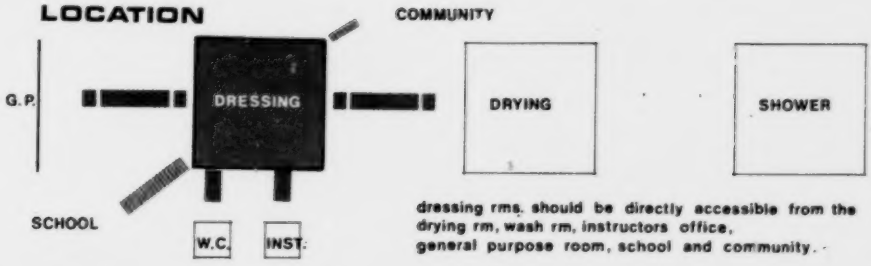
Stage Lighting

The stage area should be lit by two or three simple fixtures. In addition, if special stage lighting is required, it is recommended that reference be made to stage design in the Senior Elementary School Brochure.



Dressing Rooms

LOCATION



dressing rms. should be directly accessible from the drying rm, wash rm, instructors office, general purpose room, school and community.

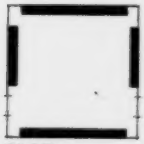
SHAPE & SIZE

as square as possible
area approx. 400 sq. ft.
average use per school day 240 students

FITTINGS

provide in dressing room the following fittings :
wall clock and loudspeaker,(both connected to school system)
mirror,(suitably located) drinking fountain,(preferably recessed in wall) bulletin board (approx 16 sq. ft.)

installation of lockers and lockerettes in dressing room is not recommended



PLAN

SECTION

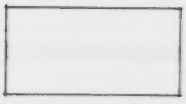
provide a 12"wide shelf 5' 10" from floor above bench

provide a 16"wide bench 18" from floor

use all available wall space

benches should be attached to wall clear of floor for easy cleaning

LIGHTING

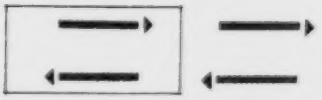


lighting level shall be 25 foot candles 4 ft above floor

HEATING

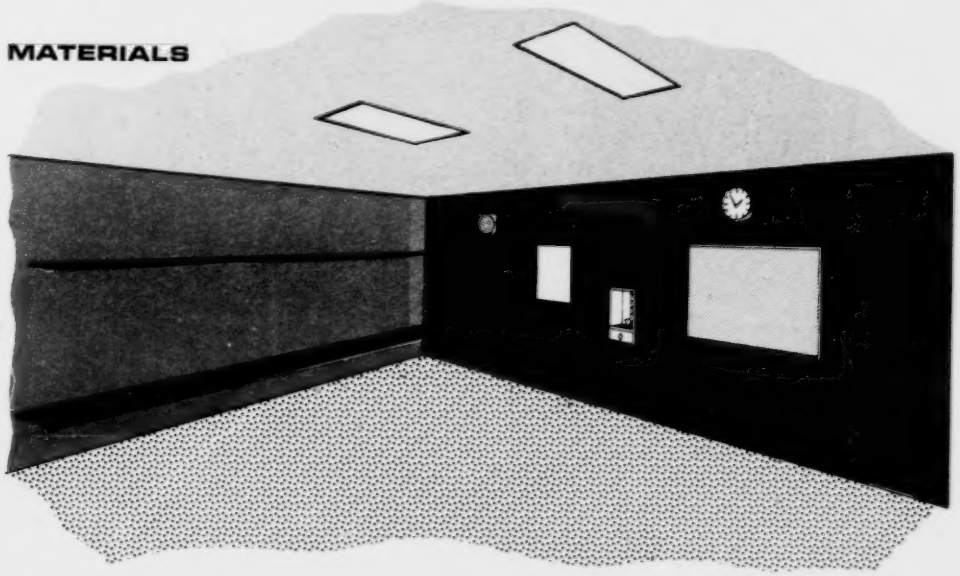
room temperature shall be 75 degrees at 5 ft. above floor

VENTILATION



provide at least 6 air changes per hr. 3 outside and 3 recirculated

MATERIALS



light fixtures must be moisture proof

walls must be of moisture resistant material

floors must be non-slip

Dressing Rooms

Dressing rooms should be square and encompass approximately 400 sq ft. Ceilings should be at least 9 ft high. Impervious non-slip material should be used for flooring – an exposed concrete floor is undesirable. Drains should be installed, including one close to the drying room exit.

Walls should be protected by a moisture-resistant finish for ease in cleaning. Sharp corners and projections should be avoided in this room.

Washrooms, and drying rooms, should be separate units with direct access to dressing rooms. Doors are unnecessary between these rooms and the dressing room.

The dressing room should be accessible directly from the school corridor, the physical education teachers' office, the general purpose room, the washroom and the drying room.

Since extremely good ventilation is essential in this area, provision for an adequate system is imperative. Many existing schools are deficient in this respect. The system should provide a minimum of six air changes per hour, of which three are "outside" and three "re-circulated". A temperature of 75-80F measured at a height of 5 ft above the floor should be maintained.

Lockers and lockerettes in the dressing rooms are not recommended. If a tote box system is desired, a separate, extremely well-ventilated room is necessary to house the boxes.

In the dressing rooms, fixed benches 16 in. wide and 18 in. above the floor, should be attached to all available wall space. Cleaning is easier if these benches are fixed to the wall rather than to the floor. A shelf 12 in. wide should be installed above all benches at a height of 5 ft 10 in. from the floor. Hooks should be attached to the wall just below the shelf at 15 in. intervals, in numbers sufficient to accommodate maximum pupil load. These hooks should have short projections only.

Additional necessities for the dressing room are: a bulletin board; mirrors; a clock and loud speaker connected to the school system; a drinking fountain and a valuables box of the slot and baffle type.

Drying Rooms

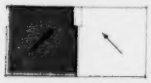
LOCATION

drying rm. accessible from dressing and shower rms. only

SHAPE & SIZE

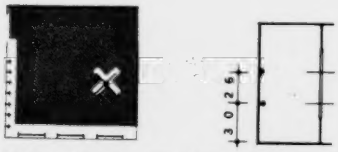
as square as possible
min. size 140–150 sq. ft.
min. ceiling ht. 9 ft.

DRAINAGE



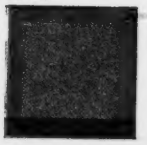
arrow indicates floor slope towards common drain between drying rm. and shower rm.

FITTINGS

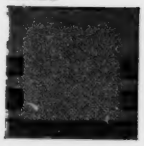


hooks or towel bars (possibly johnny poles)

BOYS



GIRLS

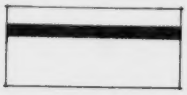


hair dryers

LIGHTING

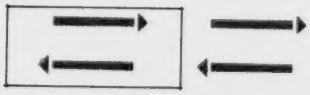
lighting level shall be 20–25 foot candles at 5 ft. above floor

HEATING



room temperature shall be 75 degrees at 5 ft above floor

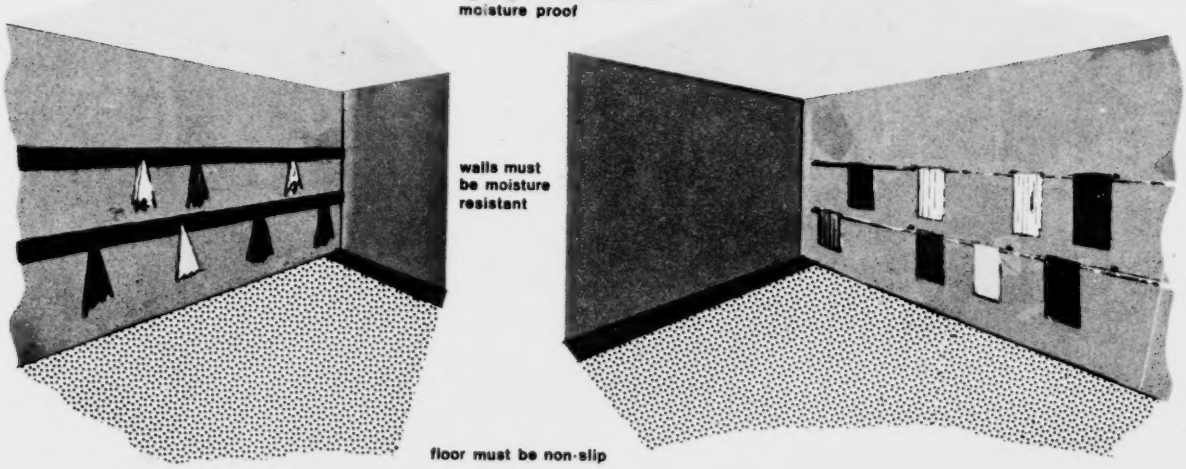
VENTILATION



provide at least 6 air changes per hr 3 outside and 3 recirculated

MATERIALS

lighting fixtures must be moisture proof



walls must be moisture resistant

floor must be non-slip

Drying Rooms

Traffic should be channelled between the shower room and the dressing room through the drying room. The drying room should be as nearly square as possible, with a minimum area of 140-150 sq ft. Ceilings should be 9 ft high. There should be no furnishings, except for short, rust-resistant towel hooks. These hooks should be 5 ft from the floor.

There should be a 4-in. curb or equivalent between the dressing room and the drying room. The floor must be non-slip and well drained and the walls moisture resistant. Lighting fixtures must be moisture proof. Good ventilation is very important.

Shower Rooms

LOCATION

shower room to be accessible from drying rm. only.

SHAPE & SIZE

BOYS

square shape is recommended

pedestal

one wall

two wall

three wall

shape of room depends on shower arrangement.
min. size 225 sq. ft.
shower heads 10–12 per rm.

GIRLS

shape depends on shower arrangement

individual cubicles (min 6 units)

open shower room

if an open shower room is used, four individual cubicles should be provided.

DRAINAGE

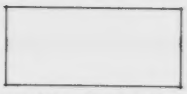
centre drain (not suitable, is easily clogged)

side drains

separation drain (doorway between shower-drying rm.)

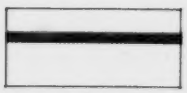
proper floor drainage is vital.
arrows indicate slope of floor towards drains.

LIGHTING



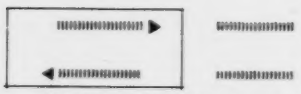
provide a lighting level of 15 foot candles at 4 ft. above the floor

HEATING



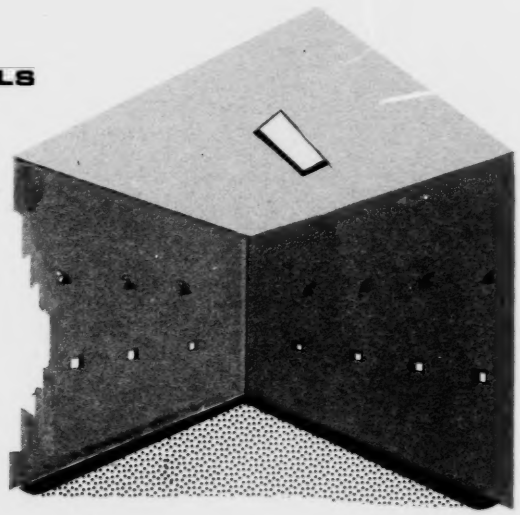
room temperature shall be 75° degrees at 5 ft above the floor.

VENTILATION



provide at least 6 air changes per hour
3 outside and 3 recirculated

MATERIALS



light fixtures must be moisture proof

walls must be of moisture resistant material

recessed soap holders or liquid soap dispensers are necessary

floor must be non-slip

Shower Rooms

The differences between boys' and girls' shower rooms are discussed following the general comments which apply to both areas.

General

Shower rooms should be accessible only through the drying rooms. These rooms should be as nearly square as possible. The recommended minimum size is 15 x 15 ft. A minimum ceiling height of 9 ft is essential.

There are many methods of shower control; one of the more common and effective is to install most of the shower heads without controls. Water pressure and temperature are regulated by controls located in a recessed and locked panel in the dressing room wall, outside the entrance to the drying room – not in the physical education teacher's office. One or two of the heads should operate independently of the main control.

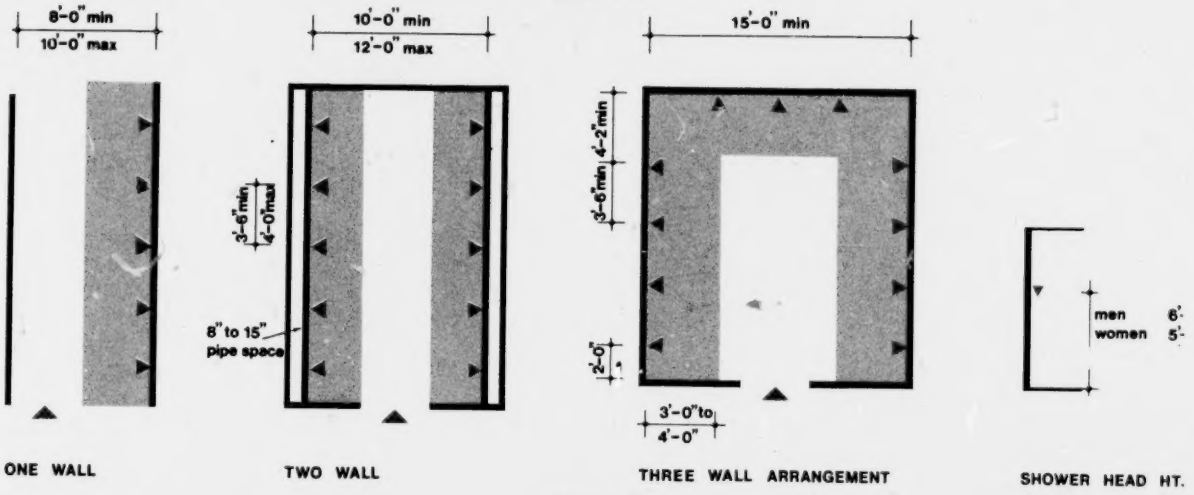
Floors must be non-slip and walls must be of moisture resistant finish. Good drainage is vital. The floor should slope from the centre to the walls. A perimeter gutter with drain outlets should be provided rather than drains in the centre of the room as they invariably become clogged when so located. Alternatively, the floor may slope to the door between the shower room and the drying room, and have a large non-ferrous grill drain in between. This grill must not present a safety hazard.

Light fixtures must be moisture proof. The ventilation system must provide at least six air changes per hour, three "outside" and three "re-circulated". Temperature should be maintained at 75-80F measured 5 ft above the floor. Light controls must be outside the shower room. A separate exhaust for the shower room is desirable.

Recessed soap holders or recessed liquid soap dispensers are also necessary.

Shower Arrangements

BOYS



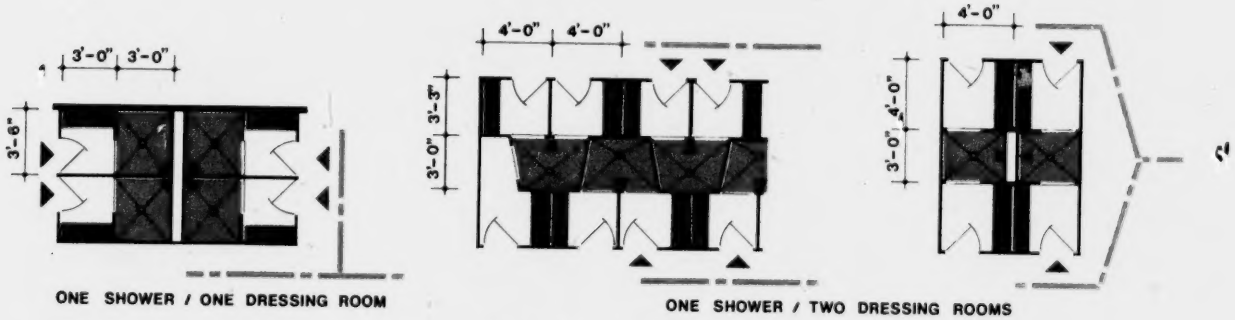
ONE WALL

TWO WALL

THREE WALL ARRANGEMENT

SHOWER HEAD HT.

GIRLS



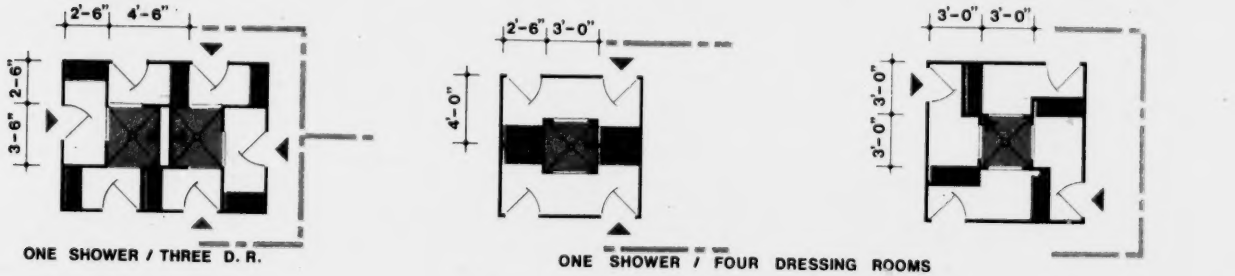
ONE SHOWER / ONE DRESSING ROOM

area per d. r. : 21 sq. ft.

ONE SHOWER / TWO DRESSING ROOMS

area per d. r. : 19 sq. ft.

area per d. r. 22 sq. ft.



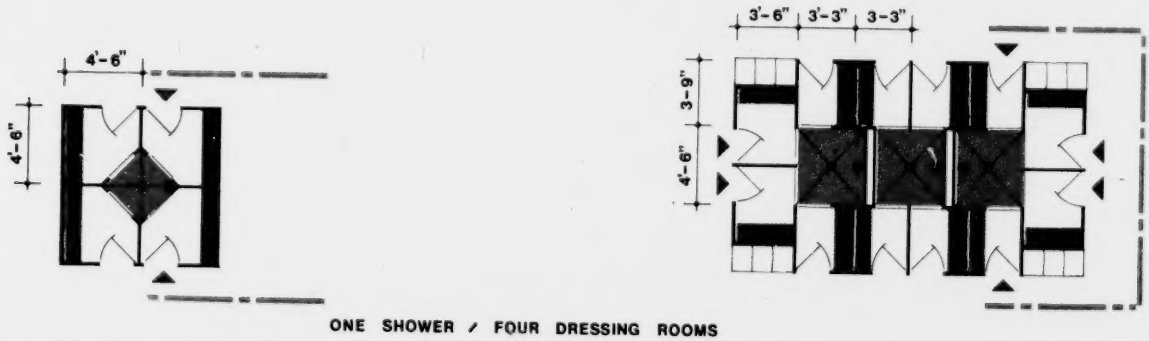
ONE SHOWER / THREE D. R.

area per d. r. : 16 sq. ft.

ONE SHOWER / FOUR DRESSING ROOMS

area per d. r. : 16 sq. ft.

area per d. r. : 20 sq. ft.



ONE SHOWER / FOUR DRESSING ROOMS

area per d. r. : 20 sq. ft.

area per d. r. : 20 sq. ft.

Boys

A minimum of 10 and a maximum of 12 shower heads is recommended. These should be placed 6 ft from the floor. Individual heads around the walls are generally more efficient than the pedestal coloumn or pillar type shower.

Girls

Individual shower cubicles with attached change areas are recommended. If this type of installation is used, there will have to be modifications in some of statements made in the general comments.

A minimum of six cubicles is recommended. If they are installed down the centre of the room, with change cubicles attached on each side, the use of each shower is almost doubled. With this arrangement, a rectangular room is desirable. Each change cubicle should contain a fixed seat and hook for clothes and towels. Each shower should have its own drain.

If an open shower room plan is used, two closed cubicles with attached change areas should also be provided. Shower heads for girls should be placed 5 ft from the floor. Hair dryers should be located in the dressing room if they are included in the plans.

Washrooms

This room should not serve as a general school washroom. It should be a separate room accessible only from the dressing room. There should be a minimum of two water closets, two urinals, and two wash basins for the boys; and four water closets and two wash basins for the girls. Mirrors should not be installed in this room. Floor, ceiling and walls should have the same finish as the shower room.

Instructors' Offices

In schools where there are special teachers of physical education, there should be an office for the male staff, and a second office for the female staff. In each case, this room should have a minimum size of 125 sq ft and a minimum ceiling height of 9 ft. A wash basin, mirror, medicine cabinet, water closet, shower and locker should be provided.

In schools where the regular classroom teacher conducts his own class in physical education, provision should be made for future construction of physical education teachers' offices.

STORAGE AREAS

Supplies in Daily Use

An equipment room with a minimum of 225 sq ft is recommended, directly accessible to the gymnasium and if possible having an exit to the playground. No wall should be less than 10 ft long.

Cupboards and shelving are required. Volleyball standards, high jump cross bars and hoops can be arranged on one wall; tumbling mats can be stored on a vertical mat rack, or on flat dollies under the stage. The physical education instructor in the school should be consulted before the sketch plans and final drawings for the storage areas are prepared.

A temperature of 60-65F should be maintained. Ducts, etc., should not interfere with construction of shelving.

The door of this room should be at least 6 ft wide to allow the easy passage of vaulting box, mat truck, etc. The ceiling must be at least 9 ft high.

Chair Storage

The physical education equipment storage room should not be used for the storage of chairs. Space under the stage can be used for this purpose.

Community Group Storage

If outside groups are to use the gymnasium, ample extra storage space should be provided for their use.

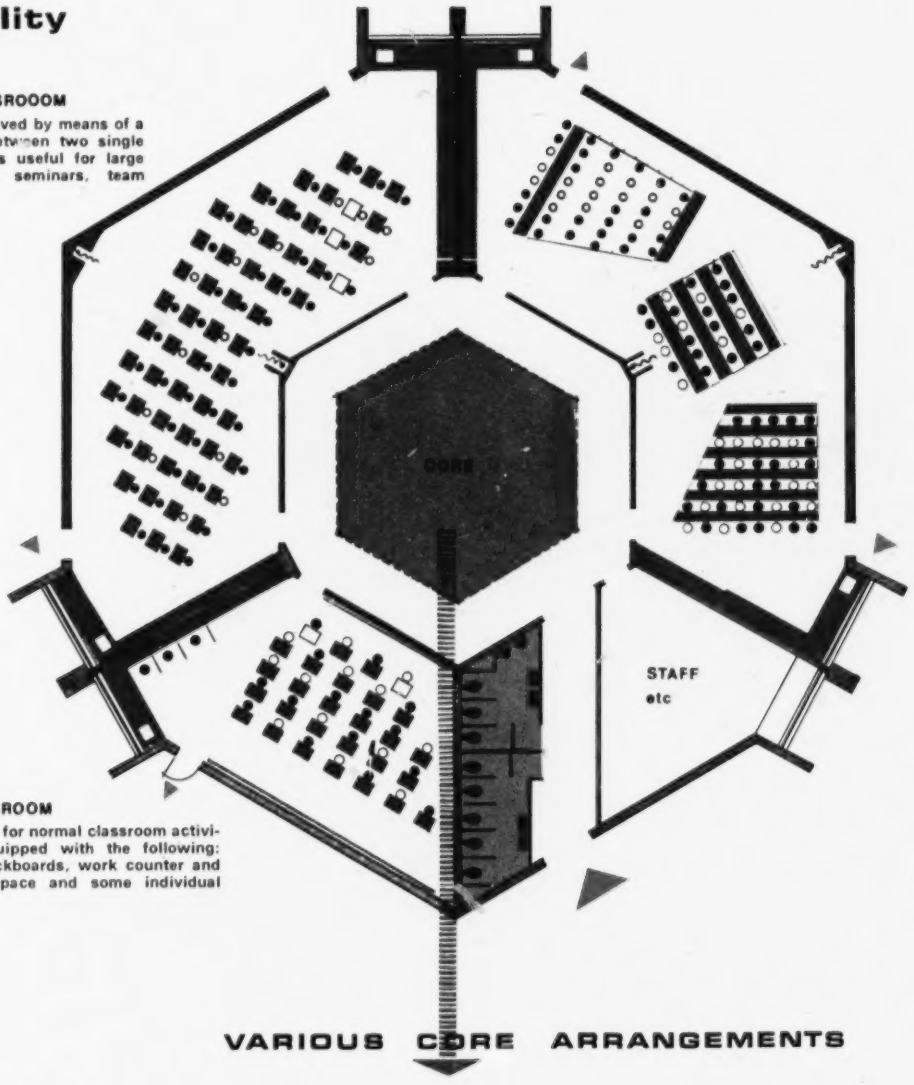
Stage

If a stage is included, its floor should be wood. No projections or stairways into the gymnasium that could interfere with physical education activities should be planned. It is recommended, again, that reference be made to stage design in the Senior Elementary School Brochure.

Flexibility

DOUBLE CLASSROOM

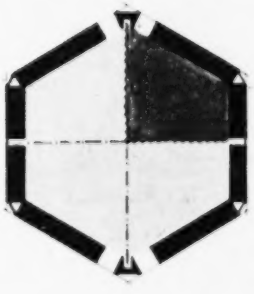
this area is achieved by means of a space divider between two single classrooms. it is useful for large lecture groups, seminars, team teaching etc.



SINGLE CLASSROOM

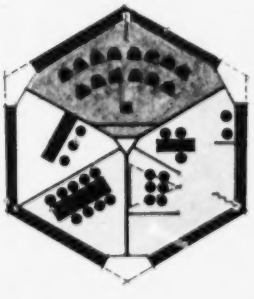
this area is used for normal classroom activities and is equipped with the following: chalkboards, tackboards, work counter and sink, storage space and some individual study units.

VARIOUS CORE ARRANGEMENTS



OPEN AREA

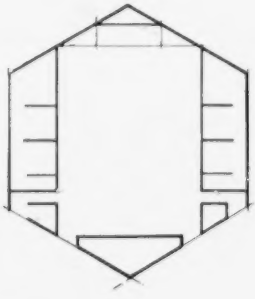
can be used as one large area or divided up for different activities by means of an acoustic curtain.



GROUP AREAS

the total area is separated into three main areas by means of fixed partitions

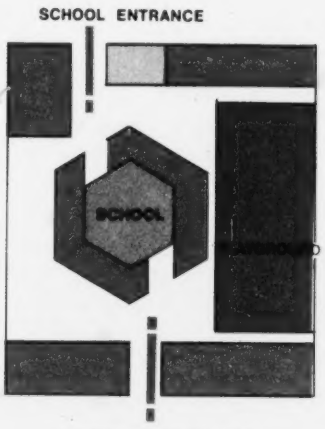
1 can be used for various activities e.g. audio-visual.
2 area separated into two by means of a chalkboard divider, used for individual study and small seminar groups.
3 small areas effected by use of chalk board dividers, used for individual study and self-instruction in audio-visual materials.



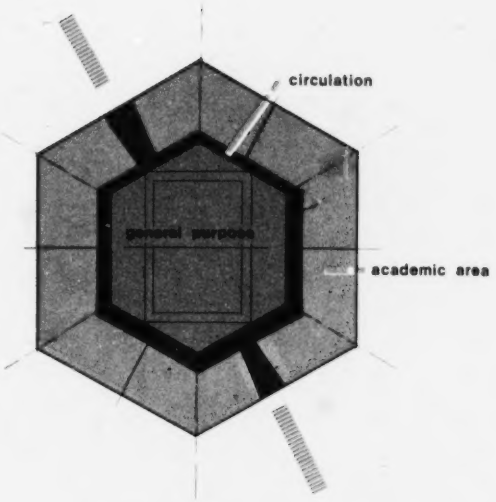
GYMNASIUM

for use of core as a gymnasium see Planning of Facilities sheet.

Planning of Facilities

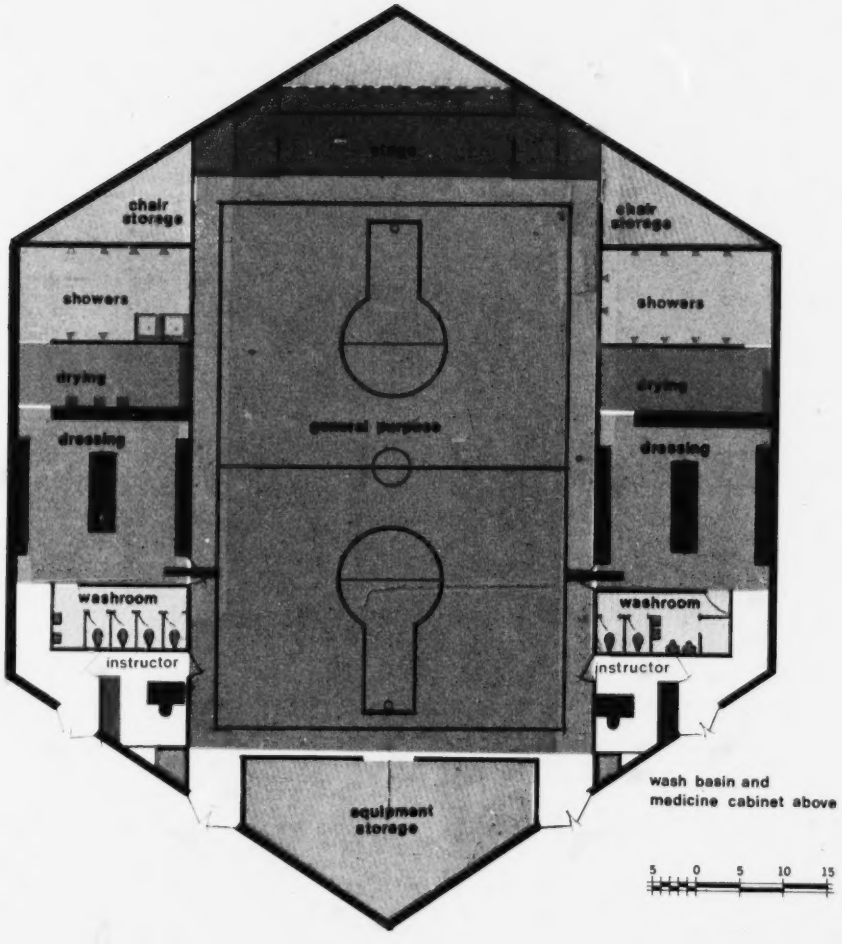


SITE ANALYSIS PLAN



AREA RELATIONSHIP

GIRLS

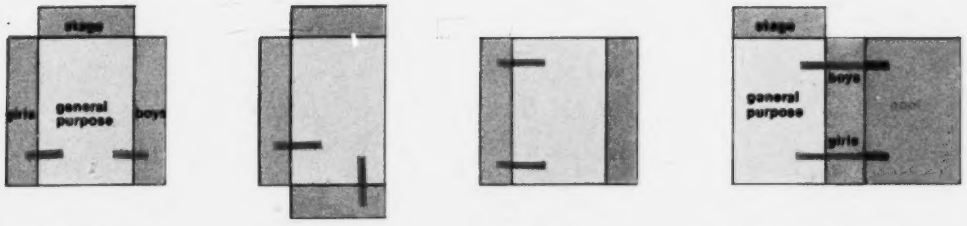


GENERAL PURPOSE ROOM

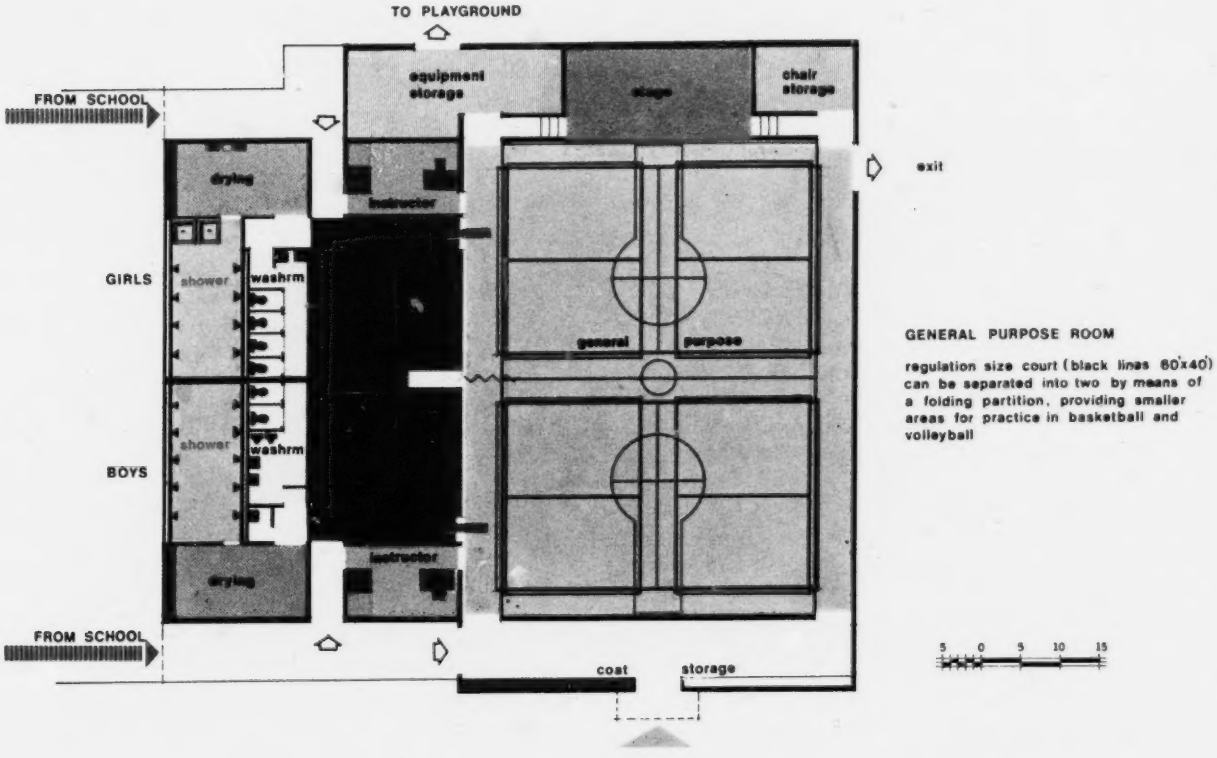
size of basketball court
60' x 40' (elementary)

3' minimum clearance at perimeter

Location of Facilities



BOTH SIDES | CORNER | ONE SIDE (see below) | CENTRE



GENERAL PURPOSE ROOM

regulation size court (black lines 60'x40') can be separated into two by means of a folding partition, providing smaller areas for practice in basketball and volleyball

THE LAYOUT AND CONSTRUCTION OF NEW PLAYING FIELDS

Principles of Planning

Playing fields and the tarmac form an essential part of the teaching accommodation of a new school. To ensure the best possible use of the school site as a whole, it is essential to prepare a preliminary layout of the playing fields at the same time as the sketch plans for the building. This should show the arrangement of the required number of soccer, touch-football, field hockey areas; softball diamonds; and track and field, volleyball and basketball facilities.

During the construction of a new school, work on the buildings and the playing fields should proceed so that both are ready for use about the same time. Best results will be obtained by integrating the various stages in the planning and construction of the playing fields with those followed for the school building.

SUGGESTED LIST OF OUTDOOR ACCOMMODATION FOR K-6 SCHOOLS

Facility	Size
Two soccer fields	90 x 50 yd
Four softball diamonds	two 40-ft bases; two 45-ft bases
Two basketball courts	65 x 38 ft
Two volleyball courts	50 x 25 ft
Two running broad jump pits	14 x 5 x 1 ft
Two high jump pits	14 x 10 x 1 ft

An asphalt area for dodgeball, four square, hopscotch, etc.

SUGGESTED LIST OF OUTDOOR ACCOMMODATION FOR K-8 SCHOOLS

Facility	Size
One soccer field	100 x 55 yd
One touch-football field	160 x 65 yd
One field hockey pitch	100 x 60 yd
Four softball diamonds	two 40-ft bases; two 50-ft bases
Two basketball courts	74 x 42 ft and 65 x 38 ft
Two volleyball courts	60 x 30 ft and 50 x 25 ft
Two running broad jump pits	14 x 5 x 1 ft
Two high jump pits	15 x 10 x 1 ft

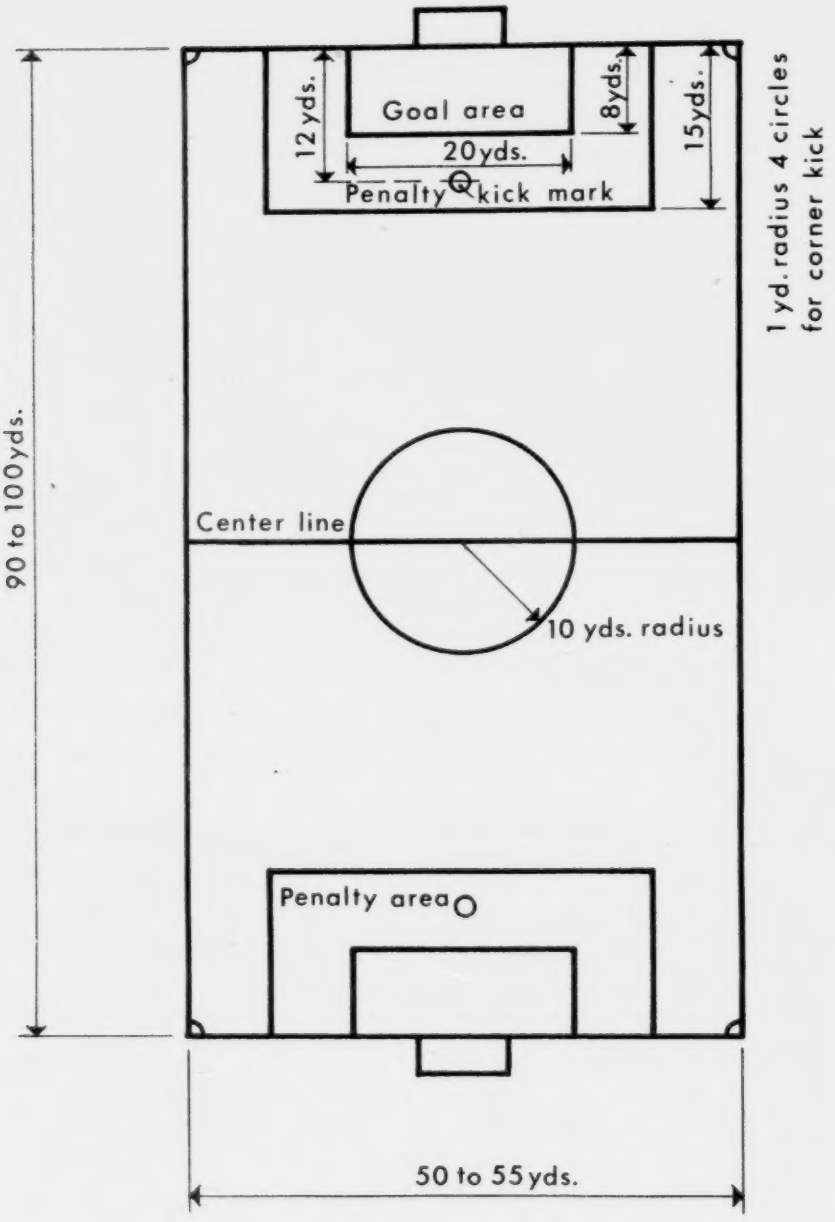
An asphalt area for dodgeball, four square, hopscotch, etc.

NOTE: For Senior Public Schools the larger size fields and courts are preferable.

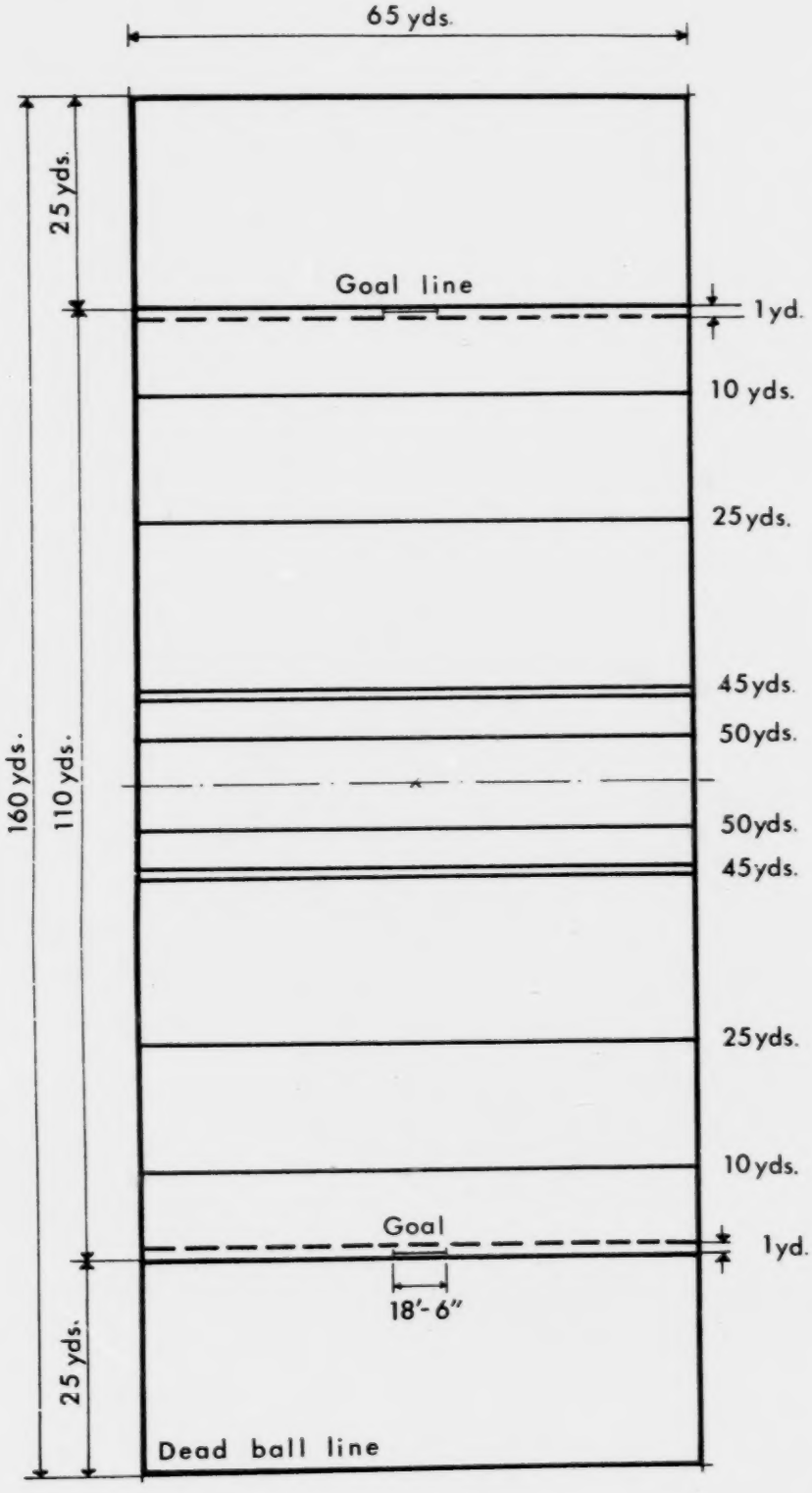
K-6 AND K-8 SCHOOLS

If possible, provision should be made for a quarter-mile, eight-lane running track. This can circumscribe the touch-football or soccer field.

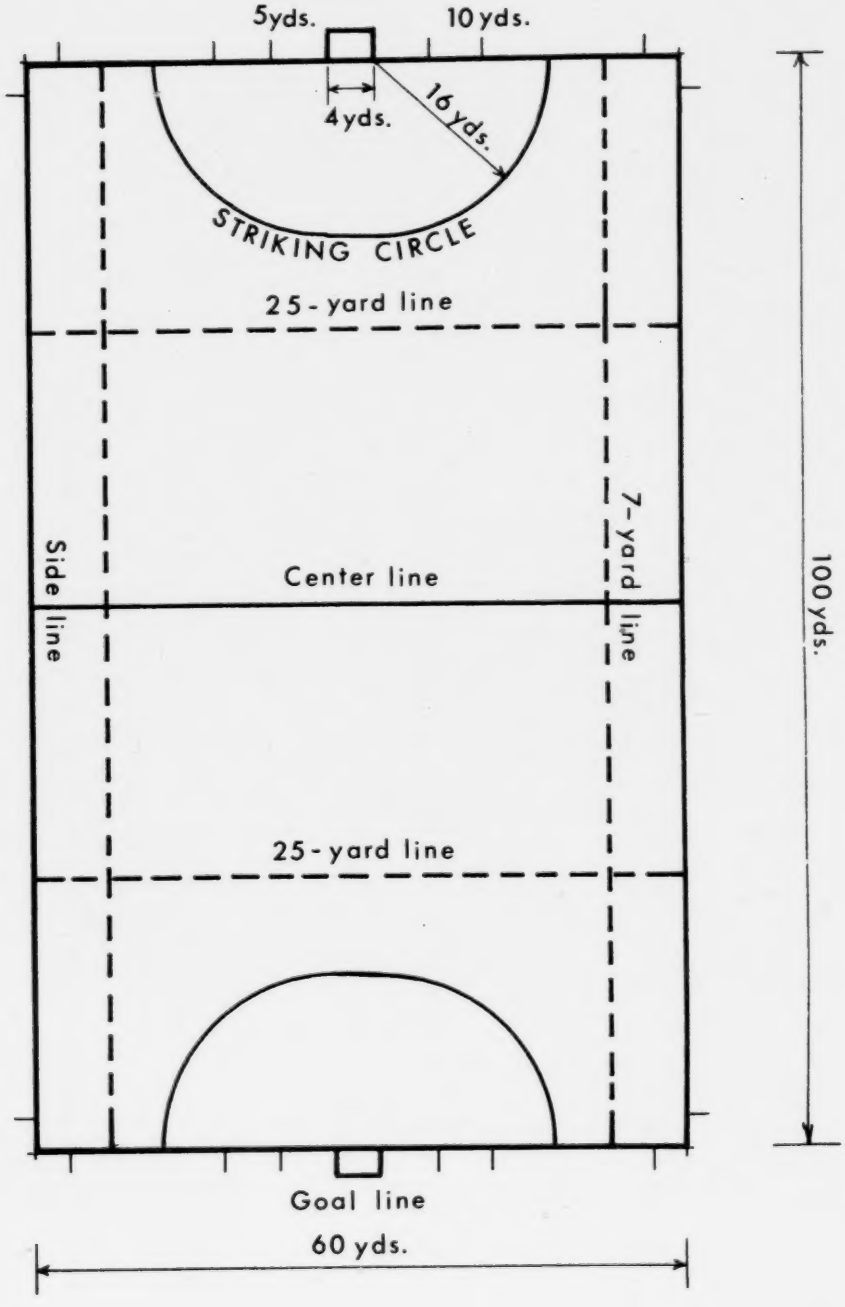
SOCCER


Goal area
12 yds.
8yds.
15yds.
20yds.
Penalty kick mark
1 yd. radius 4 circles for corner kick
90 to 100yds.
Center line
10 yds. radius
Penalty area
50 to 55yds.

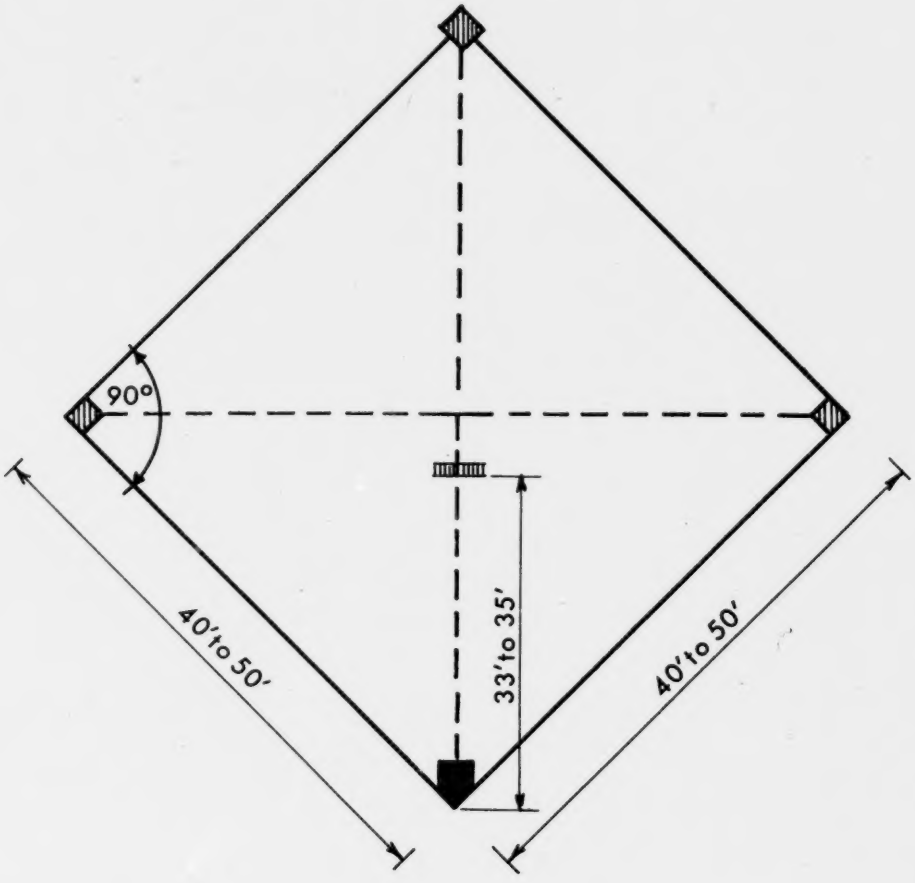
TOUCH FOOTBALL

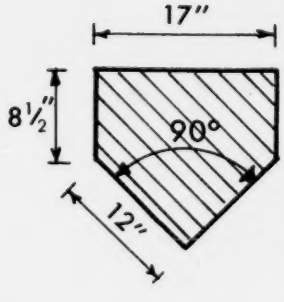


FIELD HOCKEY



SOFTBALL





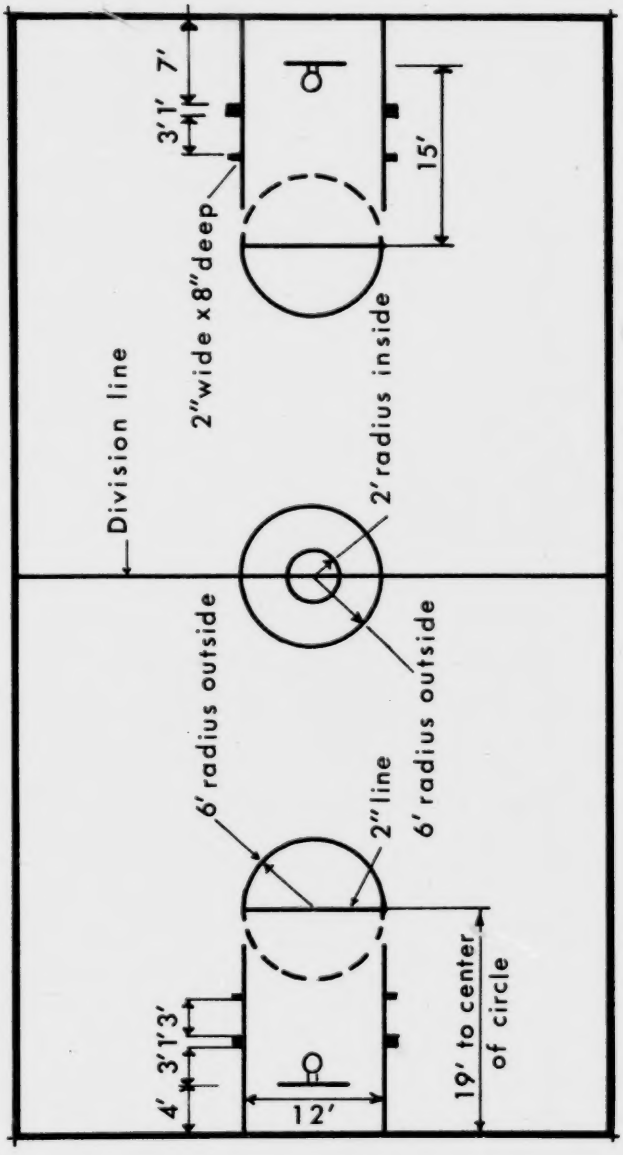
Home plate

NOTE

The Senior Elementary School Brochure
is now being prepared,
and will be published in the near future.

BASKETBALL

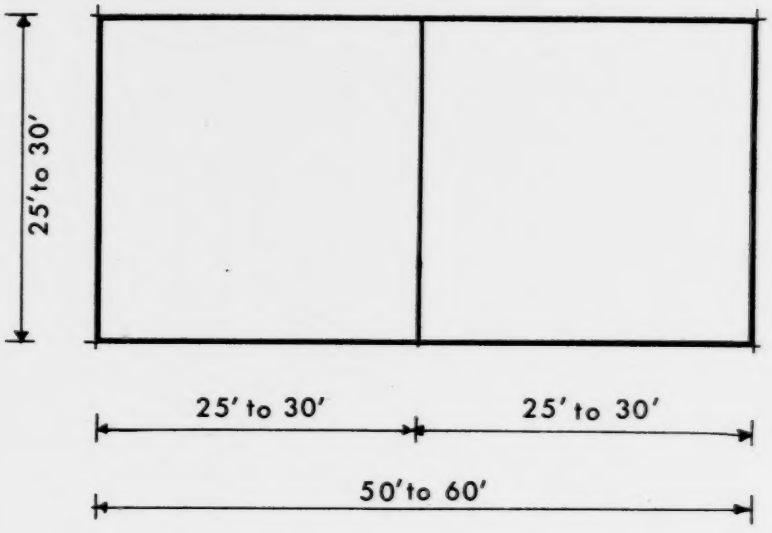
If court is less than 74 ft. long, it should be divided by two lines, each parallel to and 40 ft. from the farther end line.



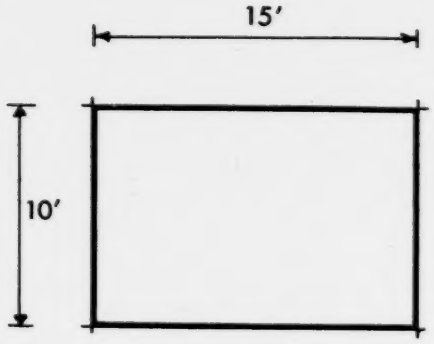
Width 38' to 42'

65' to 74' length inside.
All lines shall be 2" wide (neutral zones excluded).

VOLLEYBALL



HIGH JUMP PIT



RUNNING BROAD JUMP PIT